United States
Department of
Agriculture

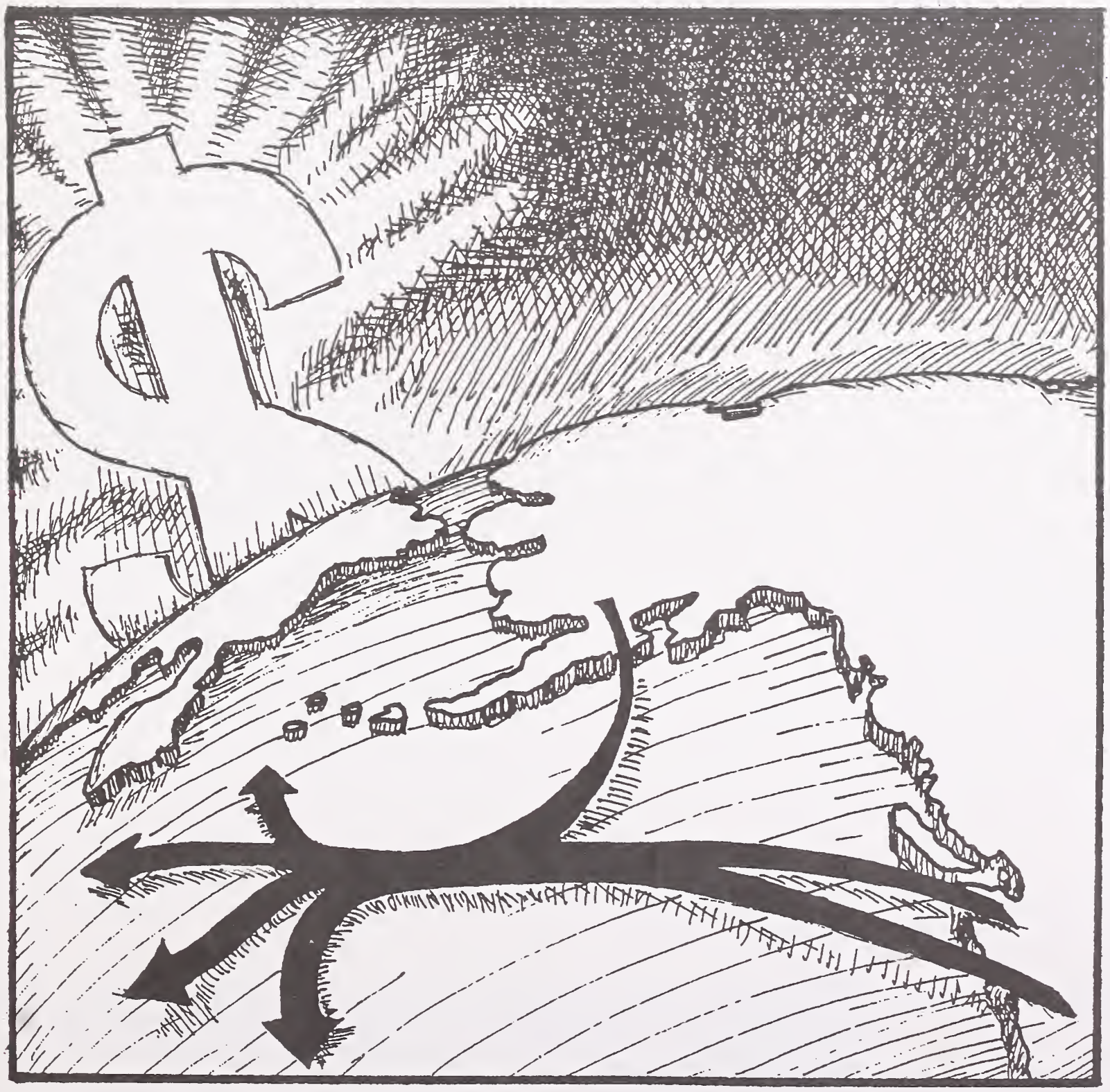
Forest Service

Pacific Northwest
Research Station

Research Paper
PNW-RP-462
July 1993

The Export Premium: Why Some Logs Are Worth More Abroad

Donald F. Flora, Wendy J. McGinnis and Christine D. Lane



Authors

The authors are research economists. DONALD F. FLORA and CHRISTINE L. LANE are at the Forestry Sciences Laboratory, 4043 Roosevelt Way NE, Seattle, WA 98105; and WENDY J. MCGINNIS is at the Forestry Sciences Laboratory, P.O. Box 3890, Portland, OR 97208.

Abstract

Flora, Donald F.; McGinnis, Wendy J.; Lane, Christine L. 1993. The export premium: why some logs are worth more abroad. Res. Pap. PNW-RP-462. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 18 p.

For as long as logs have been exported from the Pacific Northwest, they seem to have been worth more offshore than in the domestic market. Five reasons for the export premium are the inconvenience of trade, quality, extra "haul and hassle," continuity in export arrangements, and export embargoes. A large and increasing differential remains between export and domestic prices for comparable logs in high grades. Logs of lower quality do not seem to have a dual price structure, and there appears to be a declining premium for logs overall. Year-to-year fluctuations in the premium can be considerable, however, and trade policy changes typically affect the export premium more, proportionately, than they affect export volumes.

Keywords: Markets (external), supply and demand (forest products), trade (Pacific Rim), log exports, trade embargo theory.

Contents

Introduction

Throughout a century of log exports from the Pacific Northwest, export logs have been associated with higher prices than logs sold in the domestic market. Conventional wisdom currently maintains this perception that any export log is worth more than its domestic counterpart. Figure 1 compares log prices published by the Industrial Forestry Association for export and "water and inland" (domestic) transactions, averaged over all grades of Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) saw logs (Industrial Forestry Association, reported in Ruderman [1976] and Warren [1985]).[1] Differences (adjusted to 1991 dollars) were never less than $13 per thousand board feet (Mbf) (6 percent) and were as great as $204 per Mbf (45 percent) during the 23-year period shown (excluding 1973 as an exceptional market year).

The export-domestic difference, or export premium, seems to belie reason. Why would foreign buyers be willing to pay more than U.S. customers for the same log? In reality, do they? If they do, why do offshore purchasers not shift to inland logs, so that the premium would dwindle? Discussed here are circumstances that do and do not foster a continuing export premium.

Defining the Export Premium

Analytically, the log market can be dissected in several ways, each revealing a different perspective on the export premium. A premium can be identified for an individual species, a specific log grade, or a size class. It can be estimated for old growth as a class, or for timber denominated as second growth. It can be defined separately for destination countries and for classes of sellers.

At a broader level, the premium can be treated as the difference between the average value of all logs being exported and the average price of the same log mix in the domestic market. More commonly, the average value of the mix being exported is compared with the average value of the whole profile being purchased by domestic users, including material unattractive to the export market. The premium can be estimated directly from species- and grade-specific log prices (weighted by the volume of each species or grade), or indirectly by comparing stumpage prices of export-committed timber with counterpart prices of timber restricted to the domestic market. Because certain lumber products are common to the export and domestic markets, export premiums also can be estimated for them, subject to many of the considerations mentioned in this paper.

Systematic data for any of these approaches is difficult to acquire, particularly if specific data for long time series are needed. One problem is obtaining the volume of transactions corresponding to each log grade or species, especially in the domestic market. Another problem, encountered when prices of equivalent log grades are sought for the export and domestic markets, is that exact counterpart grades do not exist.

Dismembering the Premium

Regardless of whether it is defined by individual product units or broader aggregates, the export premium has several components, whose relative importance have differed over time and with different market circumstances. Elements of the premium are discussed in this section.

---

[1] The data cover western Washington and western Oregon and were compiled from individual sale reports submitted to the Industrial Forestry Association. These series were discontinued in 1985.

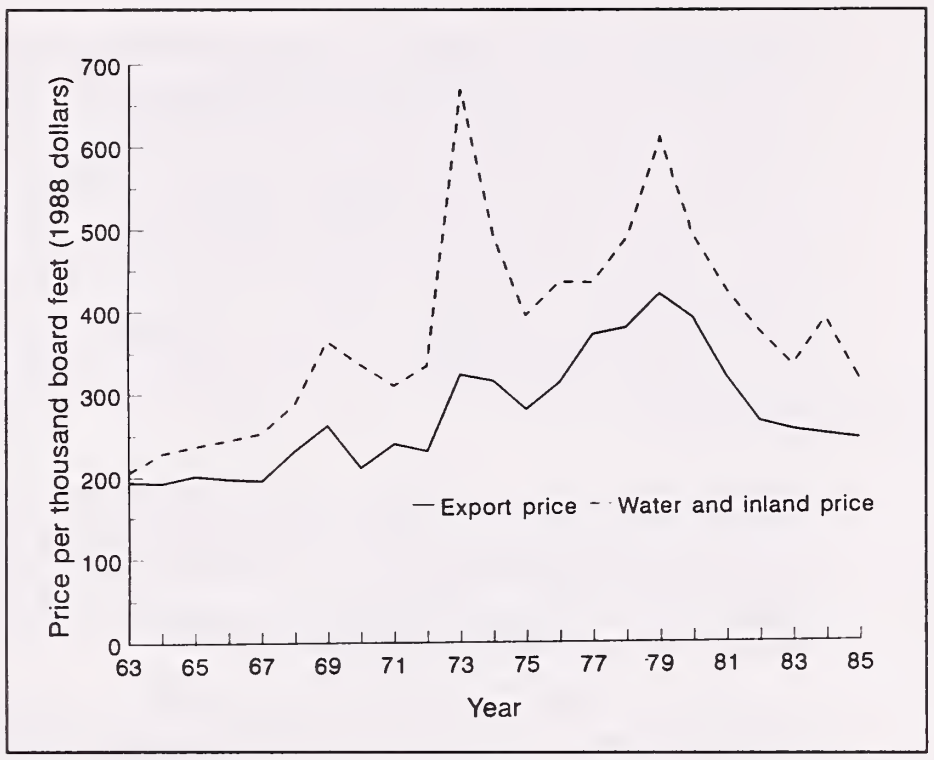


Figure 1—Domestic (water and inland) and export prices of Douglas-fir saw logs, average of all grades. Source: Industrial Forestry Association data as reported in Ruderman (1976) and Warren (1985).

Comparative Advantage

In the mid-1960s, price data (such as those in fig. 1) were the bases for claims that Japanese trading companies were bidding timber away from U.S. processors at artificially high prices to monopolize the market for export grade timber. Exporters responded that higher prices, in part, were consistent with Japanese mills' ability to get greater product recovery from the logs through meticulous sawing practices. Indeed, it was reported that recovery in Japanese sawmills averaged 70 percent (Fenton 1984), while recovery in Pacific Northwest mills was about 50 percent.[2]

The matter of comparative advantage went beyond sawmill efficiency, however. In the 1960s, real wages in Japan were well below those in the United States. The size of that advantage is difficult to gauge, in that mill workers in the two countries received different kinds and degrees of benefits. It is significant, however, that an index of real wages rose 106 percent in Japan between 1965 and 1990, and in the United States a comparable index increased only 1 percent. The Japanese wage advantage declined further due to a 56 percent drop (in real terms) in the purchasing power of the yen relative to the dollar during the same period.

Comparative economic advantage nonetheless continues to encourage Japanese log purchases, as well as those of China and Korea. With limited forest resources (either in absolute or economic terms) and relatively abundant and low-cost labor, these nations are better served by importing raw materials than finished products and at prices high enough to induce the trade. Comparative advantage (or a competitive advantage created with subsidies) underlies the potential margin from which the export premium emerges.

---

[2] A.T. Kearney International, Inc. 1978. Economic analysis of Alaskan wood products exported to Japan. Unpublished report. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, 4043 Roosevelt Way NE, Seattle, WA 98105.

It is a tenet of international economics that, almost always, overseas trade involves a price differential that compensates participants for the many risks and time lags involved (Flora and McGinnis 1989a, Flora and others 1990; also see footnote 2). In segments of the log trade involving longstanding relations, easy substitution for other products, opportunities to move among numerous buyers or sellers, or any combination thereof, the margin may narrow to a few dollars per thousand board feet. Regardless of the margin, there must be an underlying comparative advantage to sustain the trade.

Figure 2 illustrates the comparative advantage factor. In figure 2a, domestic supply and demand curves determine the onshore price and volume, P_d and Q_d, respectively, that would result in the absence of trade. With the advent of trade, supply and demand in the export market would determine the world price, P_w, as portrayed in figure 2b. The supply in figure 2b is sometimes called excess supply and is the horizontal distance between the supply and demand curves in figure 2a. The demand curve in figure 2b is foreign demand, adjusted for transportation costs to be consistent with the other supply and demand curves. The world price, P_w, is in theory higher than the no-trade domestic price, P_d, and lower than the importing country's no-trade domestic price (not shown). Comparative advantage is indicated by the fact that, given the U.S. export supply curve of figure 2b, every level of foreign demand along that supply curve involves a price higher than P_d, the no-export price in the domestic market.

The Inconvenience of Trade

Trade theory assumes that world price radiates backward to the exporter and forward to the importer, thereby equalizing prices in the domestic and offshore markets and thus creating, in effect, a single market. In reality, comparative advantage does indeed generate economic pressure waves by pushing prices downward abroad and sweeping a ground swell of demand onto North America's west coast, but the ebbing tide of prices elsewhere is not totally matched by the surge here. After adjusting for ocean transport costs, there typically remains a premium, which compensates market participants for coping with the inconvenience of a long-distance, relatively time-costly activity involving customs and laws in many nations and a variety of uncertainties and risks.

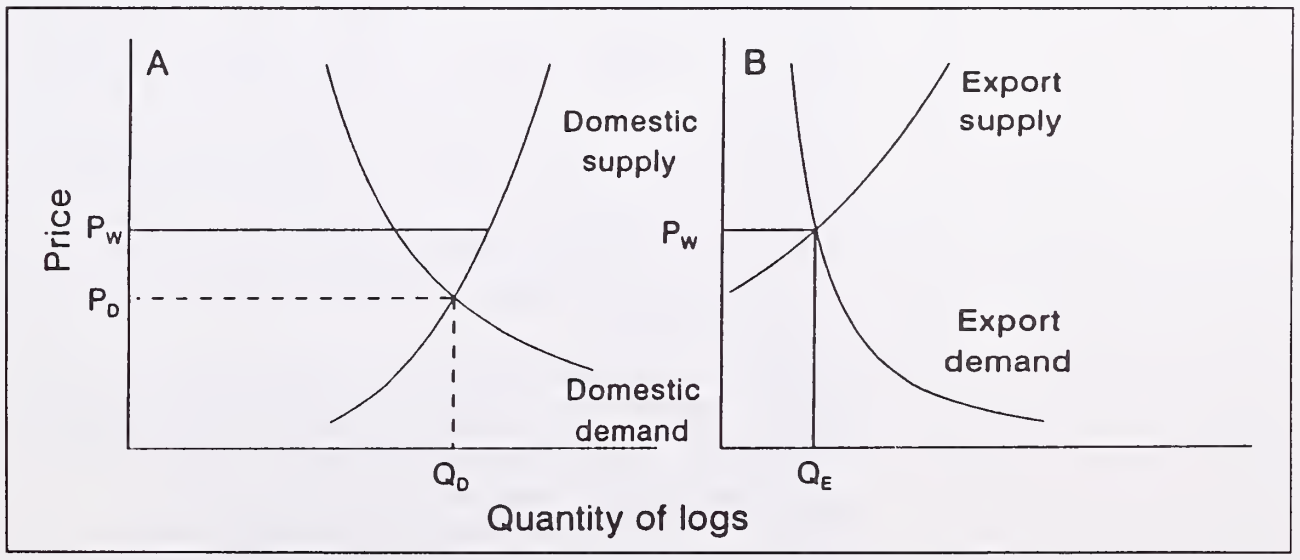


Figure 2—Comparative advantage factor: (A) domestic supply and demand of logs in the absence of trade compared with (B) the export supply and demand in the world market. (Pw and Pd denote the world and domestic log prices respectively. Volume is similarily described.)

Quality

When prices are compared between export and domestic logs, it is difficult to isolate the effect of quality. The export trade has employed neither the standard U.S. nor Canadian log grades. Customs declarations, a widely used source of economic information on trade, have reported volume and value information by timber species but not by grade. The above-mentioned Industrial Forestry Association compilations addressed the problem by asking respondents to estimate the U.S. grade that most nearly represented the logs involved in each transaction. Figures 3 and 4 illustrate the result by charting average reported prices for Douglas-fir peeler logs and Douglas-fir number 2 saw logs, respectively. As can be seen in these figures, the export premiums were narrower for some species and grades than for others. For the peeler logs (fig. 3), the premium ranged widely from -11 to 75 percent; for the number 2 saw logs (fig. 4), the range was 11 to 45 percent (1973 is excluded in both cases).

Even within these grades, however, there can be considerable variation in quality. For instance, the value of lumber produced from a single number 2 saw log at a particular mill during a single sawing session can range from $225 to $298 (in 1991 dollars), depending on where the log lies within the number 2 saw-log grade (Willits and Fahey 1988).

Another example of the quality-within-grade differential is the price difference between "coast" and "Cascade" logs. These logs are the same nominal grade, but differ in the average number of rings per inch.[3] For the Japanese number 3 grade, the price of Cascade logs in 1990 was higher by about $21 per cubic meter, or about $96 per Mbf (Japan Lumber Journal 1990).

The characteristics associated with quality offshore are the same as those recognized in the North American log grades, but they are weighted differently. Crook and sweep are penalized heavily, not only because they cannot be sawn into straight boards but also because of awkward shipboard stowage. With log cargoes constrained by bulk rather than by weight, a log with even modest sweep can occupy the space of two straight pieces. Whereas decay, broken ends, and branch stubs are allowed in certain North American grades provided recovery performance exceeds stated standards, they are virtually intolerable in the export market.

Ring count, the basis for the Cascade-coast distinction, is especially important in the definition of higher grades for Japan, with 8 and 12 rings per inch being common thresholds. While second-growth stands on low sites occasionally meet this standard,[4] it typically is associated with old-growth. Because of the increasing difficulty in obtaining old-growth logs for export, the ring-width premium is growing. Although the ring-width stipulation is not unlike that of the U.S. number 1 saw-log and number 1 peeler grades, it is difficult to make a value comparison because the U.S. grades carry a larger minimum diameter and relatively few such logs move through U.S. open-market pricing situations.

---

[3] "Cascade" logs correspond to old-growth trees whose slow growth at maturity produces many annual growth rings per inch of diameter, a highly desirable quality feature. "Coast" logs typically originate in areas first harvested decades ago and are second- and third-generation trees, notable for their relatively fast growth. The phrases "second growth," "Coast grade," and "young growth" often are used interchangeably.

[4] To be 12 inches in diameter at the top of the first 40-foot log, the tree would be at least 120 years old.

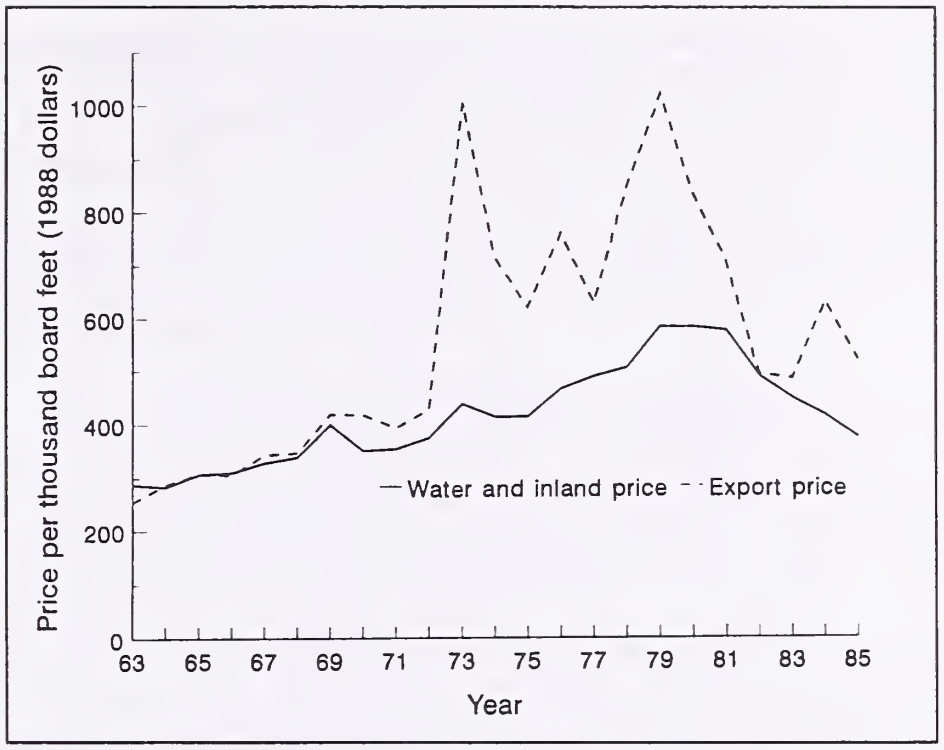


Figure 3—Domestic (water and inland) and export prices of Douglas-fir peeler logs. Source: Industrial Forestry Association data as reported in Ruderman (1976) and Warren (1985).

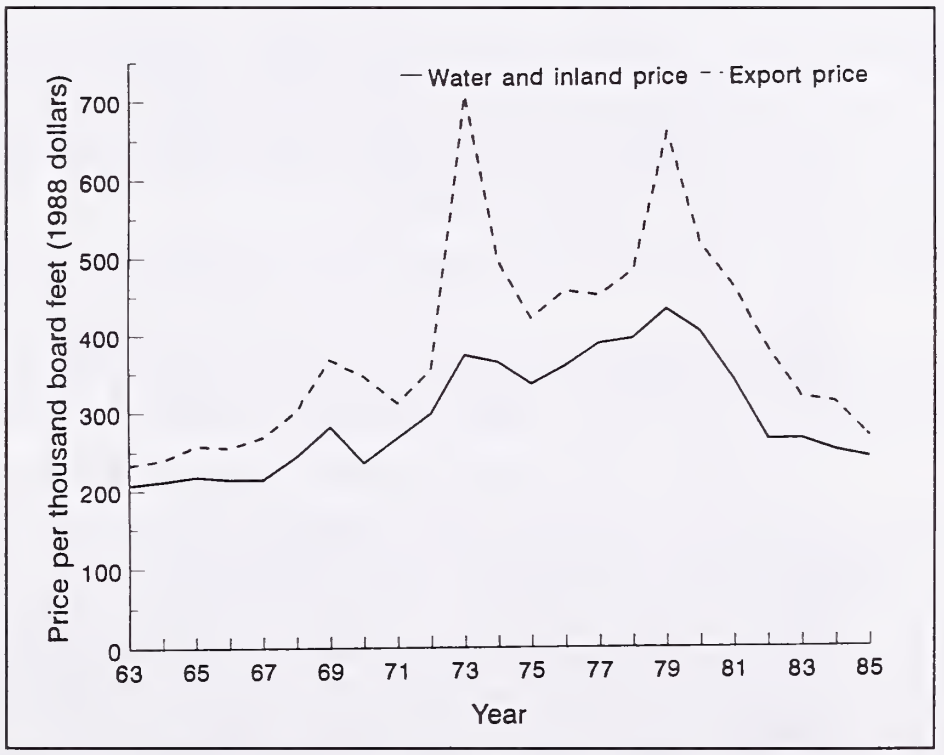


Figure 4—Domestic (water and inland) and export prices of Douglas-fir number 2 saw logs. Source: Industrial Forestry Association data as reported in Ruderman (1976) and Warren (1985).

Not only are the U.S. grades so broad as to make comparisons difficult, the offshore grades cut across and overlap the U.S. grades. An example of grade overlap is the export "C sort," pertinent to China, which is positioned generally at the lower end of the U.S. number 2 saw-log grade and overlaps into the number 3 saw-log grade.

The Transport and Handling ("Haul and Hassle") Factor

Another reason typically advanced for the difference between export and domestic prices for the same U.S. species and grades is the higher cost of assembling, transporting, sorting, and regrading export logs. Implicit here is that prices for export logs are reported after these transport-and-handling steps have been accomplished; the pricing point for logs destined for U.S. mills is closer to the woods. Marketing arrangements for both domestic and export logs differ widely, but we believe it is generally correct that export prices take into account these extra costs. Assuming that reported domestic log prices are pertinent to an inland first-transaction site not far from the woods, we have estimated that by the time a log is clearly identified as an export item, it will have been sorted at that place, graded, and moved once, with the move ranging from 10 to 100 miles, depending on how far south in the region the harvest occurs (the average distance is about 40 miles). Our estimate of the total "haul and hassle" differential between domestic and export logs is $75 per Mbf, in 1991 dollars.

It is a marketing rule of thumb in the Douglas-fir region that any truckload of 12 or fewer logs that are straight, "clean," and uniformly bucked are most apt to be destined for the export market. "Clean" means the absence of protruding knots, surface defects, and decay.

The Continuity Element

Canadian exporters remark on the lower prices they receive because they cannot assure continuity of supply. Their difficulty lies in the batch-at-a-time approval process for exporting crown timber. Asian purchasers strongly favor continuity, particularly as regards quality and quantity, as is frequently mentioned in the trade press and market studies both here and abroad.[5]

There are numerous longstanding timber supply agreements and trading relations established among U.S. firms. Conversely, a substantial number of exporting firms participate in a lively spot market in export logs, especially during strong markets. On balance, it appears that the U.S. export market involves a larger proportion of stable, albeit arms-length, relations than does the domestic log market.

For offshore log buyers, a premium for insured supplies is most prevalent for upper grade logs because of their lesser abundance and consequent difficulty in locating alternate sources. It could be supposed that suppliers would be willing to accept **lower** prices to ensure a stable outlet for their material, especially for lower grades. No doubt this is true in some cases, especially when demand is shrinking and suppliers have obligations to buy or harvest designated volumes of logs. In general, though, supply continuity is difficult and costly in a business characterized by circumscribed logging units, quickly emerging land-use regulations, unpredictable and seasonal weather patterns, difficult and variable logging terrain, sharp cyclic variations in

---

[5] Kim, John Choon; Low, Christopher; Naumann, Earl [and others]. End-use markets for Tongass forest products in Japan, Korea, Taiwan, and China. Unpublished report. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, 4043 Roosevelt Way NE, Seattle, WA 98105.

the availability of equipment, repairs and skilled labor, and tract-at-a-time stumpage purchases. In terms of figure 2, continuity demand would express itself in the position of the offshore demand curve, thereby moving the curve upward.

We have no data on the size of the continuity stipend. Certainly the size differs widely, being lowest during improving markets and for buyers and sellers having the least to lose from market volatility or lost trading partners. It is high for market participants aiming to establish and hold a target market share. We judge that at times it reaches 15 percent of the "going" export log prices.

Export Embargoes

The most commonly advanced reason for the export premium given by people in the industry is the scarcity of preferred species and grades created by the U.S. embargo on exports of most state-owned and all Federal logs. Observations and theoretical considerations support this argument, particularly for old-growth logs. The embargo limits to domestic manufacture most of the old-growth harvest in the Douglas-fir region.

Figures 5 and 6 are graphic explanations using recent market data of export-embargo economics. Whereas figure 2 shows how domestic and offshore prices tend to converge in an unfettered market, figures 5 and 6 show how they diverge when trade is restrained by partial embargoes on log exports from the Pacific Northwest.

In 1989, in connection with a policy analysis, we estimated the export premium for old-growth logs harvested in the Douglas-fir region (Flora and McGinnis 1989b). At the time, old-growth logs were a significant component of log exports; they figured in several policy controversies. Figure 5 portrays 1988 markets for such logs. Figure 5a shows the supply of U.S. high-grade logs available to the export market, and the offshore demand curve for them, after adjustment for the transport-and-handling (haul and hassle) factor. Export supply is made up mostly of private logs; it also includes the portion of roundwood from state-owned lands that is allowed to be exported.[6] The intersection, at $600 per Mbf, is our estimated average 1988 export price for old-growth logs.

Figure 5b illustrates the 1988 domestic market for old-growth logs. If non-Federal logs were a relevant part of the domestic supply, the price would have been $300. With non-Federal high-grade logs bid away by the export market, the remaining (Federal) supply generated a price of $400.

The $200 differential between export and domestic prices, $600 versus $400 per Mbf, respectively, was the export premium perceived in the trade in 1988 for old-growth logs, after adjusting for other elements of the export premium. A (smaller) premium also was present for the upper grades of second-growth timber, notably those in the older age classes. After allowance for continuity and haul and hassle, the premium was not evident for lower grades. We did not observe it for logs in the U.S. number 3 saw-log grade nor in the lower portion of the number 2 saw log grade; however, had we averaged prices for domestic number 2 saw-logs, and for their offshore equivalent individually, an apparent scarcity premium would have appeared for the whole grade.

---

[6] Until 1991, logs from state-owned lands could be exported. After 1990, most state-sold logs could not be exported; an exception permits one-fourth of Washington State's State-sold log harvest to be sent abroad.

Market Shares: Theory and Reality

There is a substantial discrepancy between actual market behavior and that predicted by theory. For 1991, figure 6 consolidates into one frame the graphs of export and domestic supply and demand, for logs of all grades. As in earlier figures, the curves pertain to markets in the Douglas-fir region. Export supply and demand include private timber and a fraction of state timber; domestic supply and demand embrace all Federal timber and the remaining private and state logs. Shapes of the supply and demand curves are drawn from recent studies (Flora and McGinnis 1991); their positions in the frame depend on their 1991 price-volume intersections. Also shown is the export-embargoed share of domestic supply. This includes Federal and most state-sold logs.

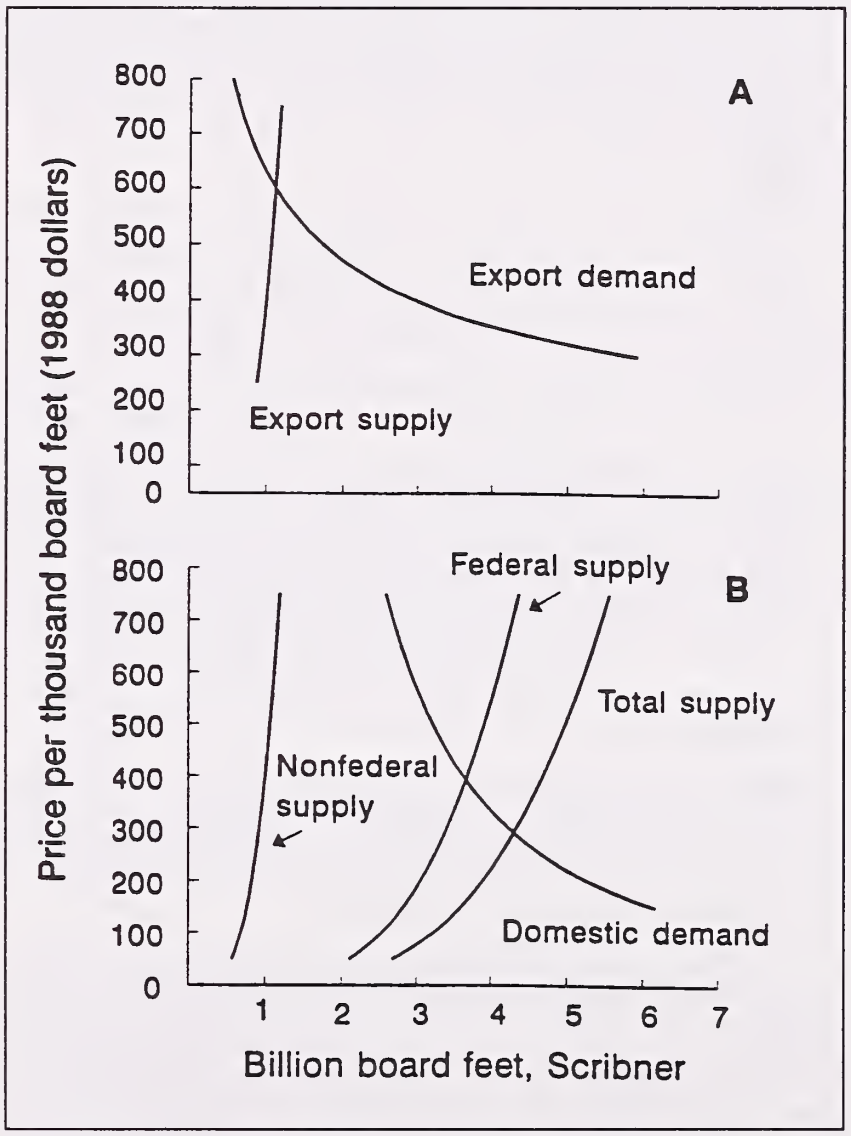


Figure 5—1988 markets for high-grade logs: (A) export supply and demand and (B) domestic supply and demand. Source: Constat-elasticity functions were fitted to 1988 market data. Price elasticities and their sources are export supply 1.5 (Flora and McGinnis 1992, McGinnis and Flora 1991); export demand -0.33 (Flora and McGinnis 1992); domestic supply 0.97 (McGinnis and Flora 1991); domestic demand -0.28 (McGinnis and Flora 1991); embargoed supply 0.30 (Flora and McGinnis, 1989, unpublished data, "Embargoes On and Off"; notes on file with the authors.)

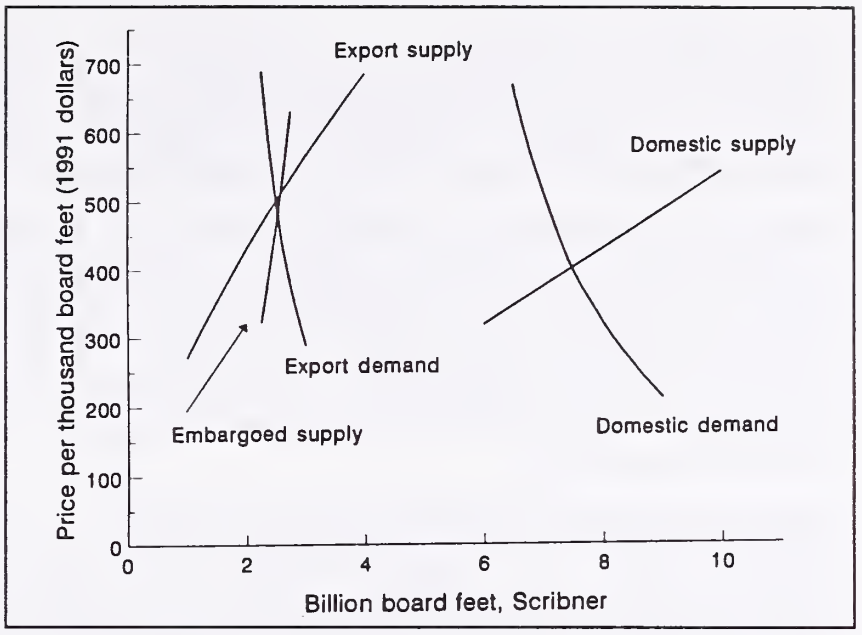


Figure 6—1991 supply and demand of domestic and offshore logs. Price elasticities and their sources are export supply 1.5 (Flora and McGinnis 1992, McGinnis and Flora 1991); export demand -0.33 (Flora and McGinnis 1992); domestic supply 0.97 (McGinnis and Flora 1991); domestic demand -0.28 (McGinnis and Flora 1991); embargoed supply 0.30 (Flora and McGinnis, 1989, unpublished data, "Embargoes On and Off"; notes on file with the authors.)

As Sedjo and Wiseman (1983) note, the theoretical effect of an export barrier is to direct all unrestricted (mostly private) logs toward export because of the higher prices resident there, with the domestic market served solely by embargoed logs. The barrier effect occurs only in the price region above the intersection of embargoed supply and domestic demand; that is, where domestic demand does not absorb a volume at least equal to the embargoed supply.[7] Within that upper price region, theory indicates that private and export-unrestricted state logs should be moving exclusively to offshore purchasers, while Federal and export-restricted state logs should be the only source available to domestic buyers.

This clean market cleavage, with private logs going in one direction and embargoed logs in another, does not occur in practice. In 1991, for instance, the unrestricted (exportable) supply in areas tributary economically to export ports in the Pacific Northwest exceeded log exports by about 200 percent.

There are several reasons. Domestic wood products manufacturers wanting high-quality logs can and do meet the export price. Second, many of the non-Federal logs of relatively low quality have not interested offshore buyers, even at correspondingly low prices. The matter is complicated further by the recent rapid drop in the fraction of old-growth logs in the export mix. Broadly speaking, Federal logs are old growth (high quality). The evolution of harvesting on non-Federal lands has led, in the Pacific Northwest, to rapidly declining availability of private old growth in both export and domestic markets. This trend has been accompanied by fast-changing technologies

[7] Technically, this is the region in which "excess supply" (total log supply less domestic demand) exceeds the nonembargoed supply. The theory provided by Sedjo and Wiseman (1983) posits a kinked export supply curve, with a flatter lower portion reflecting supply originating in both the private and public sectors.

and preferences abroad. We have estimated that in the mid-1980s, more than 80 percent of U.S. log exports were old-growth and high-quality second-growth timber. Only about 15 percent of the logs exported from the Pacific Northwest were in the lower grades. By the early 1990s, the latter figure had become about 50 percent.

Recent structural changes in the log market, with substantial adjustments in the domestic and export log market profiles, do not invalidate the theory. Rather, market activity has moved to the lower region of figure 6, where domestic consumption greatly exceeds embargoed log supplies. Alternatively, it could be argued that embargoed supplies are best characterized in a separate graph, where the special quality of public logs and the general absence of such high-valued logs in the nonpublic sector could be recognized.

By 1991, old-growth logs had become a minor vein in the export stratigraphy while the scarcity premium remained negligible in the lower log grades. Was there still an apparent premium in the middle grades? In 1991, the average Northwest export volume and price (from Warren 1992), adjusted for haul and hassle, were about 2.5 billion board feet and $500 per Mbf. Although the quantity of logs that moved to domestic processors in 1991 is fairly clear (about 7.5 billion board feet), their average price is not known. We assumed an average price based on Douglas-fir and hemlock (*Tsuga* sp.) number 2 saw logs, arriving at $400 per Mbf. The implication is that an average log would have been worth $100 per Mbf more if exported than if sold into the domestic market.

A conclusion specific to middle grades is more difficult. If number 2 saw logs are an indicator of midgrade domestic prices, an offshore counterpart is needed. Absent that, two common quality groups being exported have been characterized by a price-reporting firm as "whitewood, Japan 12B" and "whitewood, China 12" (Log Lines 1991); these groups lie generally at the upper and lower ends, respectively, of the number 2 saw-log spectrum for whitewoods. In mid-1991, the firm reported a difference of about $75 per Mbf between these export log prices, with the domestic number 2 price near the bottom of the range.[8] Certainly, then, the 1991 export premium pertained not only to log markets on average, but also to the specific midrange quality component.

Tracking the Export Premium

Figures 7-11 show the relative trends of domestic and export prices for nearly comparable log assortments. Figure 7 is oriented to the sorting-yard, microeconomic, entrepreneurial level of the log trade. Most exported logs pass through a sorting yard, and the bulk of transactions occurs at that level as harvesters and haulers move timber from the woods. Sorting-yard operators, who may have mills or export facilities, or both, at the same site, usually publish offering prices for spot purchases and typically buy from scores of suppliers. Most Northwest ports have one or more log-buying yards on the premises or nearby; in addition, there are many inland purchasing-sorting points. From these places, price signals radiate into the woods to guide log-making decisions; at these yards most final, log-at-a-time determinations are made on whether timber will be exported or used onshore.

[8] These were offering prices for delivered truckloads.

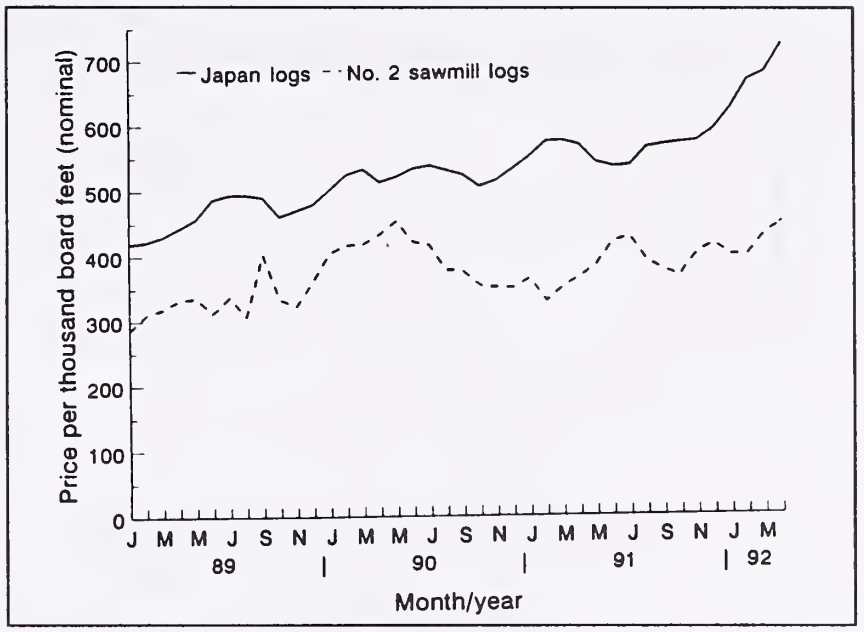


Figure 7—Sorting-yard prices for mid-grade second-growth Douglas-fir export and sawmill logs. (Source: Log Lines [various issues].) Japan 12B logs are straight logs with scaling diameter of 12 inches or greater and a clean, smooth surface. Defect not to exceed 10 percent, and log lengths generally must average 36 feet.

Figure 7 is based on average prices in the Puget Sound region for Douglas-fir logs from second-growth trees (Log Lines, various issues). The domestic grade is number 2 saw logs at least 12 inches in diameter and without a minimum ring count (Northwest Log Rules Advisory Group 1982). The Japan 12B series alludes to export logs of high quality, also 12 inches or greater in diameter, without a minimum number of growth rings. Between mid-1990 and mid-1992, the price difference between these domestic and export grades widened steadily, from about 22 percent to about 38 percent.

Available for a longer period is a comparison of old-growth sawmill (domestic) number 2 log prices with at-the-dock f.a.s.[9] prices for "Japan regular" logs; these data also are for Douglas-fir logs in the Puget Sound region (Pacific Rim Wood Market Report, various issues). Figure 8 compares these series to illustrate the additional premium associated with (1) old-growth and (2) the transport-handling factor. Of the difference between the prices, we estimate that $50-75 per Mbf reflects the haul and hassle factor associated with export logs. The remainder of the apparent premium, about $150 per Mbf in late 1986, rose to about $300 by mid-1992. In percentage terms the increase was less significant—from about 36 to about 41 percent over the 5-1/2 years.

Figure 9 illustrates the export premium for lower grade logs, with prices of domestic number 3 logs compared with reported prices for "K-sort" logs (destined for Korea). These are the lowest graded logs exported in significant quantities.

Together, figures 7-9 indicate larger export premiums in higher grades in both absolute and relative terms. The figures also show that within-grade premiums increased gradually in the late 1980s and early 1990s.

---

[9] Free alongside ship, f.a.s., is the value of logs at dockside, ready for loading.

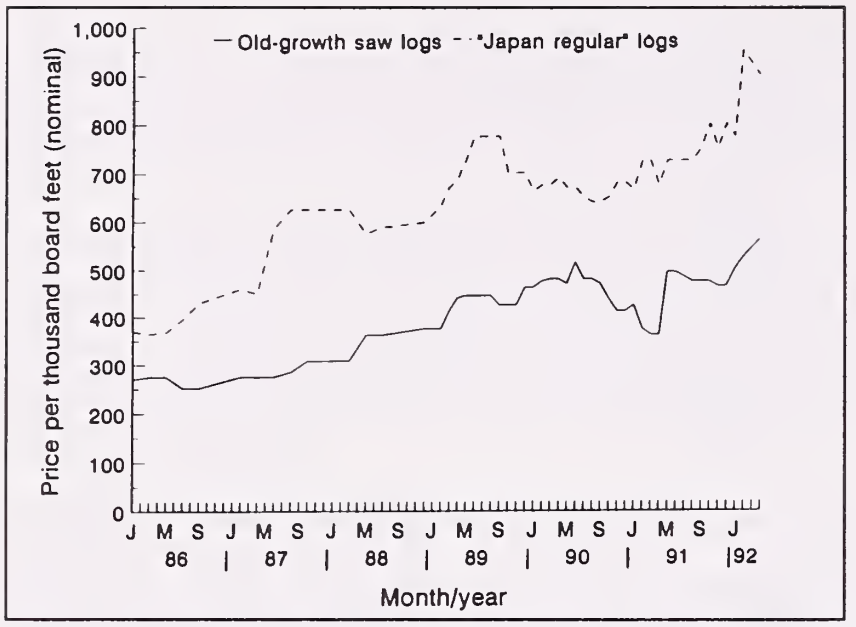


Figure 8—Inland and export prices for mid-grade old-growth logs. (Source: Pacific Rim Wood Market Report [various issues].) Japan regular logs require a 12 inch minimum diameter and 6 to 8 rings per inch and have an average length of 34 feet.

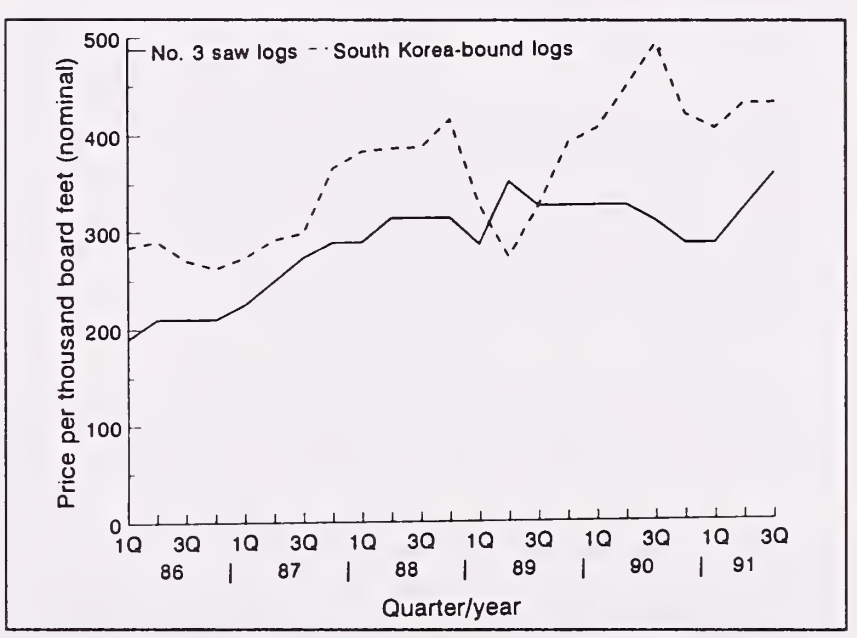


Figure 9—Prices of small domestic and South Korea-bound hemlock logs. (Sources: Pacific Rim Wood Market Report [various issues], Warren [various issues].) Prices are for logs delivered to mills and F.A.S., respectively.

Mainly because of quality differences among the logs purchased by various countries, international variation in the export premium can be substantial (fig. 10). For a given type of log, arbitrage among sales channels tends to make the f.a.s. price constant among countries of destination, despite different levels of demand, variegated tariffs, and different shipping costs. In figure 10, the national premiums are the difference between Pacific Northwest mill prices for domestic logs and f.a.s. prices for exported material. "Japan-bound" data pertains to Japan regular and U.S. number 2 sawmill second-growth logs, all hemlock. Korean buyers have traditionally favored small-diameter logs. The Korea curve is based on the average value of all logs sent to Korea and domestic number 3 saw logs; both categories are hemlock.

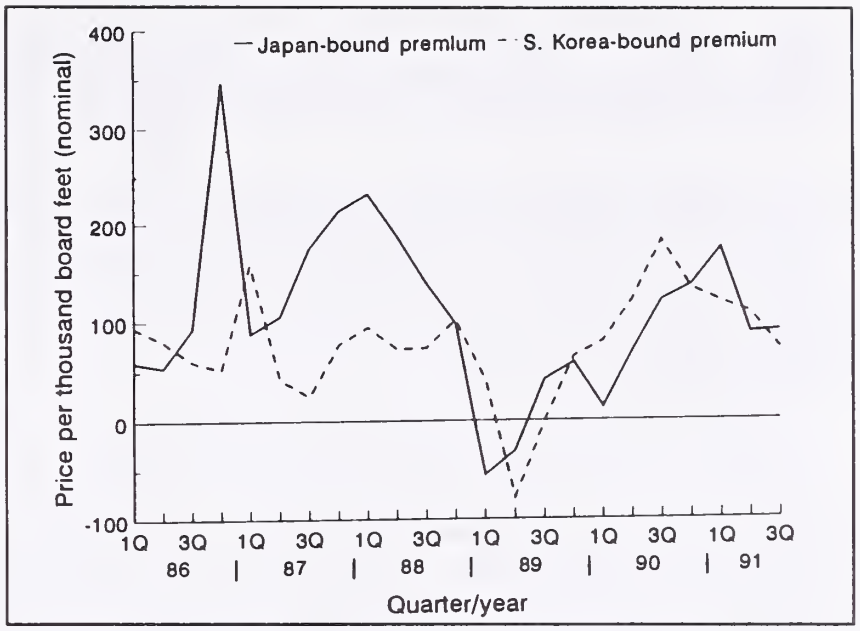


Figure 10—Country-related export premiums for hemlock logs. (Sources: Pacific Rim Wood Market Report [various issues], Warren [various issues].)

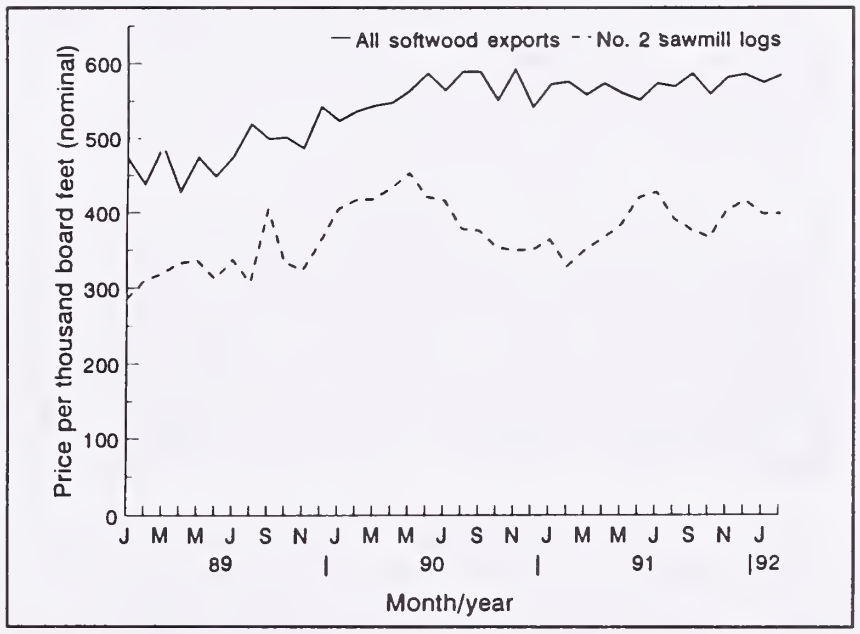


Figure 11—Representative domestic and average export log prices. (Sources: Log Lines [various issues], USDA Forest Service files.)

Figure 11 treats the price for inland-grown second growth (see fig. 7) as representative of average domestic-log prices and compares it with the average reported value of exported logs of all grades, to all countries (Warren, various issues). This is the broadest possible aggregate, and as with the others, no price data are available for domestic counterparts. For examining export activity as a whole and for assessing proposed broad-commodity trade policies, such aggregates have an important role; however, they also obscure trends important to analysts of industry structure, as demand and supply circumstances change for particular species, grades, consuming countries, and supplying regions.

Variation in the Export Premium

Figures 1 and 2 illustrate the year-to-year variation in the export premium before 1986. Although there was a fairly consistent premium for all logs combined, there was considerable variation over time in individual grades.

The annualized data of figures 1, 3, and 4 show the sharp increases in the export premium that occurred during the strong housing markets (both abroad and in North America) in 1973 and 1978-79. Peaks appeared again in 1989 and 1992 (figs. 8-11). The range of variation now appears to have declined, however, given that the monthly and quarterly data of figures 7-11 amplify the changes that are smoothed in the earlier figures (figs. 1-6).

Another feature of different aggregates is illustrated in figure 10. The sharp trough in hemlock prices in 1989 is not mirrored in the earlier figures relating to Douglas-fir.

Policy Changes and the Export Premium

Recent, current, and candidate timber and trade policies have the potential to change the export premium. A shift in either the export or domestic supply curve of figure 2 or 6 almost certainly affects the domestic-offshore price differential. Several recent policy analyses have examined the magnitudes of these changes in order to estimate revenue, income, and employment impacts.

A Congressional proposal to permit states to tax exported timber led to exploration of impacts of various tax levels on log and lumber shipments and on prices. [11] It was estimated that in 1992 a 10-percent ad valorem duty would have increased the average log export price premium, relative to average prices of domestic logs, about 14 percent.

Mentioned earlier was the representation of 1988 markets for old-growth logs (fig. 5). That was part of a study of the effects of halting exports of logs from state-owned lands (Flora and McGinnis 1989b). Applying a model proposed by Sedjo and Wiseman (1983) and Parks and Cox (1985), we estimated that without such a policy, the export premium for old growth was about $200 per Mbf, and the average for all logs was $60 per Mbf. With the policy imposed, we estimated that the premium for old growth would expand to $350 per Mbf (about 100 percent of the domestic price); or about $120 per Mbf for all logs (about 36 percent of the domestic price).

McKillop (1991) also derived an export premium in 1988 that estimated the average export premium for state timber to be 135 percent of domestic prices (that is, export prices were almost 2-1/2 times the domestic prices), and that the premium would increase 8 percent from $170 per Mbf if state logs were export-embargoed. An interesting feature of this analysis is that it pertained to stumpage rather than to log prices. This level of assessment is especially appropriate to the problem of estimating revenue gains and losses to timberland owners. Invariably, the export premium associated with stumpage is a higher percentage than that for logs.

McKillop (1991) compared the selling prices of National Forest and Washington State timber for several thousand transactions occurring in 1983-90 and stratified them by species and 12 other market-relevant factors; in this way he derived volume-weighted average export premiums. Because National Forest timber could not be exported

---

10 Flora, Donald; Lane Christine; Haynes, Richard. 1993. Wood products trade, forest replanning, and forest habitat conservation in the U.S. northwest. Unpublished report. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, P.O. Box 3890, Portland, OR 97208

while Washington State timber was unrestricted during the study years, the price difference was taken to be the stumpage premium lost if State timber could not be exported. McKillop arrived at an average premium of 135 percent of the restricted-timber price.

In reexamining the issue and using 1990s prices as a base (the policy actually imposed) and a more elaborate model than before, Flora and McGinnis (1991) estimated that an export embargo on 75 percent of Washington State-sold timber, coupled with a complete embargo on Oregon State-sold timber, would increase the export premium for logs by about $87 per Mbf or 55 percent. These numbers are consistent with the earlier Flora-McGinnis estimate once one accounts for the substantial price changes that occurred between 1988 and 1990.

In 1992, Baker[11] and Conway[12] examined the same issue, the effect of the State-log embargo on the economy in Washington State by looking at actual pricing of State-sold timber during most of 1991. By then, the 75-percent embargo had created two classes of State timber, export-restricted and unrestricted. Presale stumpage appraisals, reflecting the relative quality of the two timber classes, had assigned to unrestricted timber values averaging $46 per Mbf higher than those for export-restricted timber, thereby revealing the quality component of the stumpage premium. During bidding, unrestricted timber sold for $105 per Mbf more than restricted lots. Of this figure, $59 ($105 minus $46) was the embargo-caused (scarcity) premium. It was estimated, however, that only about 60 percent of unrestricted logs were actually of export caliber, suggesting that the scarcity premium associated with those logs, at the stumpage level, was actually $98 per Mbf ($59/0.60).[13] This was about 37 percent of the restricted-timber average price.

Together, these several studies of an embargo's effect on the export premium illustrate the considerable leverage that market cycles can have on apparent—and estimated—premiums. Similar variance has appeared among investigations of spotted-owl enhancement economics. The Flora-McGinnis model (1991) was used in estimating the combined effects of spotted-owl reservations, other recent reductions in planned harvests, and the state-log embargo. Impacts were compared for 1990, a

---

[11] Baker, Janet. 1992. Price premium—evidence from post-ban DNR timber sales. Memorandum dated January 14, 1992. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, 4043 Roosevelt Way NE, Seattle, WA 98105.

[12] Conway, Ricahrd S., Jr. 1992. The economic impact of log export restrictions on Washington State trust lands. Olympia, WA: Washington Research Council. 13 p. Unpublished report. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, 4043 Roosevelt Way NE, Seattle, WA 98105.

[13] Washington Research Council. 1992. Winners and losers in the log export ban. Unnumbered policy brief dated January 27, 1992. 6 p. On file with: Trade Research, Pacific Northwest Research Station, USDA Forest Service, 4043 Roosevelt Way NE, Seattle, WA 98105.

relatively strong market year, and again for 1990, but assuming the economic conditions of 1991, a recession year. The export premium for softwood logs would have increased 140 percent had the full first-year force of the policies been felt in 1990. Had they occurred fully in 1991, the premium would have risen 57 percent; this because the recession spanned half of 1990 but all of 1991. It follows that in a more robust business year, these policies will markedly increase the export premium.

A Negative Export Premium?

Successive increments of constraint on log exports clearly have heightened the price difference between domestic and export logs. Domestic prices decline and export prices rise, with the latter predominating. The two-decade ban on exports of Federal logs produced a premium that we estimated at $60 per Mbf in 1988, after adjusting for transport and handling differences. That was about 17 percent of the domestic price. By 1992, the near-total embargo on old-growth from the Pacific Northwest, combined with log scarcity in the region and less elastic demand offshore relative to domestic demand, created a differential that we have estimated to be about $150 per Mbf, or about 30 percent of the domestic price.

Although much media and political attention has focused on the high prices received for old-growth logs in the export market, old-growth material earns high prices in the domestic market as well. Tightened export policy, coupled with a declining private old-growth resource, has resulted in most (public) old-growth logs constrained to the domestic market. Foreign demand for select lumber grades has risen, the result of our export embargo on logs. For instance, during 1991, the average value of logs exported from the Northwest rose 3 percent. Meanwhile, the average value of old-growth logs climbed about 15 percent in the export and domestic markets.

If the price difference between old- and second-growth timber is great enough, and if their shares in the two markets change substantially, the quality premium in the domestic market might, in time, equal or even exceed the scarcity premium in the export market, creating higher average prices in the domestic market. This, then, would be a negative export premium.

Another source of apparently negative premiums is exemplified in figure 10, where hemlock prices in the domestic and Korean markets are compared. From these kinds of data, Korean prices might easily appear lower than average U.S. domestic prices at times, especially when the dollar is strong relative to the won, demand is weak in Korea for other reasons, or U.S. demand is particularly robust. In this case, however, the key reason is that although the species is the same, two different quality levels are being compared.

Conclusions

The export premium for logs, long observed and widely cited as a rationale for taxing or constraining log exports, is not an element of pure profit nor fortuitous gain. Rather it has several components that reflect the structure of price reporting and ordinary, competitive market behavior. Accounting for much of the apparent premium are geographic differences in point-of-sale pricing and the failure of U.S. log grades to characterize the export quality mix. Compensation for transport and handling (haul and hassle) and for maintaining a smooth but just-in-time flow of material when the smallest unit exported is a shipload worth millions of dollars also adds to the cost—and

markup—of exported logs. Because some importers place high value on an increasingly scarce part of the timber resource, the average value of logs going abroad rises above that of domestically sold logs. Finally, much of the remaining apparent premium is attributable to the inconvenience and risk of exporting—long time frames and a long market pipeline, rapidly fluctuating markets, exchange-rate uncertainties, a multitude of unfamiliar business customs and law, and cumbersome and distant dispute resolution.

From 1988 to 1992, the domestic and export log markets underwent substantial change. The log-export profile was mostly high-quality, larger second growth, while the domestic mix was dominated by old-growth and lower grade second growth. It remains useful, then, to view the export market as segmented between quality classes as well as between public and nonpublic (exportable and constrained) sources. Export premiums are apparent still, despite the continuing mobility of non-old-growth logs between domestic and offshore users. Even after adjustments are made for quality and the transport-handling factor, other economic reasons for the premium remain.

Although public interest often focuses on "the" export premium as a relatively constant market element, the export verses domestic price differentials differ significantly among time periods, log species, and grades. Export price data imply country differences too, which exist if quality differences are not isolated. Higher percentage premiums occur for stumpage than for logs. Policies designed to inhibit trade raise the premium substantially, as does any supply compression, whatever its cause.

Literature Cited

Fenton, R.T. 1984. Sawn timber in Japan, and New Zealand prospects: progress report. Rotorua: New Zealand Forest Service, Forest Research Institute. 121 p.

Flora, Donald F.; McGinnis, Wendy J. 1989a. Alaska midgrade logs: supply and offshore demand. Res. Pap. PNW-RP-411. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 13 p.

Flora, Donald F.; McGinnis, Wendy J. 1989b. Embargoes on and off: some effects of ending the export ban on Federal logs and halting exports of state-owned logs. Western Journal of Applied Forestry. 4(3): 77-9.

Flora, Donald F.; McGinnis, Wendy J. 1991. An analysis of the effects of northern spotted owl conservation, harvest replanning, a log embargo, and recession on the Northwest log and lumber trade. Western Journal of Applied Forestry. 6(4): 87-90.

Flora, Donald F.; Woller, Ulla; Neergaard, Michael. 1990. Tradeoffs and interdependence in the Alaska cant and log markets. Res. Pap. PNW-RP-422. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 11 p.

Japan Lumber Journal. 1990. Various issues.

Log Lines. 1991. [Mount Vernon, WA]: [Arbor-Pacific Forestry Services, Inc.]. III(8): [August]. Monthly.

Log Lines. Various issues. [Mount Vernon, WA]: [Arbor-Pacific Forestry Services, Inc.]. Monthly.

McKillop, William. 1991. Estimation of losses in timber sale revenues of the Washington Department of Natural Resources due to restriction of log exports under the Shortage Relief Act. Berkeley, CA: University of California, Department of Forestry and Resource Management. 17 p. [+ 24 p. app.].

Northwest Log Rules Advisory Group. 1982. Official log scaling and grading rules. [Published by six log grading and scaling bureaus in the Pacific Northwest.] 48 p.

Pacific Rim Wood Market Report. Various issues. [Seattle, WA]: [Jay Gruenfeld Associates, Inc.]. Monthly.

Parks, Richard W.; Cox, Judith. 1985. The economic implications of log export restrictions: analysis of existing and proposed legislation. In: Deacon, Robert T.; Johnson, M. Bruce, eds. Forestlands, public and private. San Francisco: Pacific Institute for Public Policy Research: 247-273.

Ruderman, Florence K. 1976. Production, prices, employment, and trade in northwest forest industries, 2d quarter 1976. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 67 p.

Sedjo, Roger A.; Wiseman, A. Clark. 1983. The effectiveness of an export restriction on logs. American Journal of Agricultural Economics. 65: 113-16.

Warren, Debra D. 1985. Production, prices, employment, and trade in northwest forest industries, second quarter 1985. Resour. Bull. PNW-127. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 62 p.

Warren, Debra D. 1992. Production, prices, employment, and trade in northwest forest industries, fourth quarter 1991. Resour. Bull. PNW-RB-192. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Warren, Debra D. Various issues. Production, prices, employment, and trade in northwest forest industries. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Quarterly.

Willits, Susan; Fahey, Thomas D. 1988. Lumber recovery of Douglas-fir from the Coast and Cascade Ranges of Oregon and Washington. Res. Pap. PNW-RP-400. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 32 p.

*U.S. GOVERNMENT PRINTING OFFICE: 1993-790-301/80021

Flora, Donald F.; McGinnis, Wendy J.; Lane, Christine L. 1993. The export premium: why some logs are worth more abroad. Res. Pap. PNW-RP-462. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 18 p.

For as long as logs have been exported from the Pacific Northwest, they seem to have been worth more offshore than in the domestic market. Five reasons for the export premium are the inconvenience of trade, quality, extra "haul and hassle," continuity in export arrangements, and export embargoes. A large and increasing differential remains between export and domestic prices for comparable logs in high grades. Logs of lower quality do not seem to have a dual price structure, and there appears to be a declining premium for logs overall. Year-to-year fluctuations in the premium can be considerable, however, and trade policy changes typically affect the export premium more, proportionately, than they affect export volumes.

Keywords: Markets (external), supply and demand (forest products), trade (Pacific Rim), log exports, trade embargo theory.

The **Forest Service** of the U.S. Department of Agriculture is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.

Pacific Northwest Research Station
333 S.W. First Avenue
P.O. Box 3890
Portland, Oregon 97208-3890

Flora, Donald F.; McGinnis, Wendy J.; Lane, Christine L. 1993. The export premium: why some logs are worth more abroad. Res. Pap. PNW-RP-462. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 18 p.

For as long as logs have been exported from the Pacific Northwest, they seem to have been worth more offshore than in the domestic market. Five reasons for the export premium are the inconvenience of trade, quality, extra "haul and hassle," continuity in export arrangements, and export embargoes. A large and increasing differential remains between export and domestic prices for comparable logs in high grades. Logs of lower quality do not seem to have a dual price structure, and there appears to be a declining premium for logs overall. Year-to-year fluctuations in the premium can be considerable, however, and trade policy changes typically affect the export premium more, proportionately, than they affect export volumes.

Keywords: Markets (external), supply and demand (forest products), trade (Pacific Rim), log exports, trade embargo theory.

Pacific Northwest Research Station
333 S.W. First Avenue
P.O. Box 3890
Portland, Oregon 97208-3890